G-329

70

Customer: Swedish Space Corporation; Lennart Bjorn
Payload Mgr: Sven Wallin
NASA Tech Mgr: Tom Dixon
Mission: STS-42, January 22, 1992

The purpose of this experiment was to improve understanding of the effect of gravity on the solidification process of alloys. The payload included three experimental furnaces and an energy buffer, which was designed to protect the payload from excessive temperatures.

G-329 was the first Swedish payload to be flown in the GAS program.

G-086

71

Customer: Booker T. Washington Senior High School, Houston, Texas; F. D. Wesley
Payload Mgr: David Yoel
NASA Tech Mgr: Tom Dixon
Mission: STS-42, January 22, 1992

This payload involved two experiments: the artemia (brine shrimp) experiment that attempted to hatch and grow shrimp in microgravity, and the air/water chamber of the fluid physics experiment, in which measured amounts of air were to be injected into a chamber filled with distilled water resulting in air bubbles of different sizes. Research indicated the direction and speed of bubble movements would depend on both bubble size and temperature.

This experiment shows the diversity of research that has been done in a GAS canister.

G-609

72

Customer: Australian Space Office, Canberra, Australia; J. Boyd
Payload Mgr: Mike Petkovic
NASA Tech Mgr: Fred Witten
Mission: STS-42, January 22, 1992

The Endeavor payload was an Australian ultraviolet light telescope designed and built by Auspace Limited for the Australian Space Office. It was designed to obtain ultraviolet images of violent events in nearby galaxies of interest to science.

Two interconnected GAS cans housed the components of the payload. One canister contained the optical elements, a large format photon counting array detector and a control computer. The other GAS can contained a flight battery and two tape recorders for recording data produced by the detector.

By interconnecting two GAS canisters, the Australian Space Office was able to fly larger scale instruments in one canister with the batteries and data recorders in the other canister.

G-610

Customer: Australian Space Office, Canberra, Australia; J. Boyd
Payload Mgr: Mike Petkovic
NASA Tech Mgr: Fred Witten
Mission: STS-42, January 22, 1992

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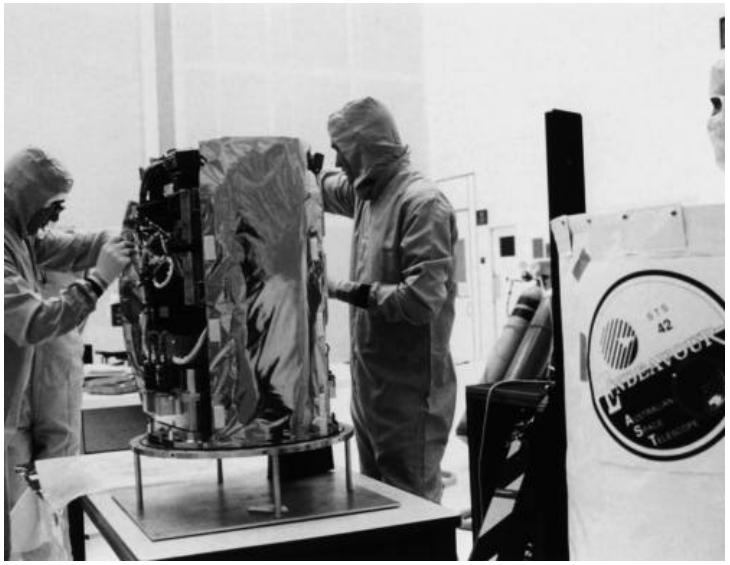

The optical elements of this experiment were housed in a GAS canister with a motorized door so it could open in space.

G-614

74

Customer: American Assoc. for Promotion of Science in China and the Chinese Society of Astronautics; Mark C. Lee
Payload Mgr: Ke Shouquan
NASA Tech Mgr: Tom Dixon
Mission: STS-42, January 22, 1992

This payload consisted of two experiments. For the first experiment, small lumps of different materials were stored in a container which had a side wall covered with a sheet of adhesive paper. A movie camera was mounted in the container to photograph the motion of debris upon their release in the microgravity environment. In the second experiment, two low melt-point materials were pre-mixed in various ratios in solid form on Earth to be remelted in space, then left to cool and resolidify.

The experiments were designed by students selected in 1986 from more than 7,000 proposals. The experiments represented the first time a payload from China was carried aboard a Space Shuttle.

(L to R) Dong-Bo Yu, Larry Thomas, Weiquan Feng, Tom Dixon, and Xueming Chen were present during integration of G-614. This was the first time a payload from China was flown on the Space Shuttle.

G-336

Customer: Dept. of Defense
Space Test Program;
Colonel J. E. Armstrong
Payload Mgr: Keith Longstreth
NASA Tech Mgr: Tom Dixon
Mission: STS-42, January 22, 1992

VIPER was designed to measure the visible light reflected by intergalactic dust. The data from these measurements would be used to validate and update existing data collected in earlier experiments and would help provide background measurements of visible light for use in space surveillance.

The GAS program by providing an inexpensive access to space, has enabled scientists to learn from their experiments and re-fly them in a modified format so they can do further studies.

G-457

76

Customer: The Society of Japanese Aerospace Companies, Inc.; N. Tateyama
Payload Mgr: Takemasa Koreki
NASA Tech Mgr: Herbert Foster
Mission: STS-42, January 22, 1992

In this experiment, modes of bubble movement in liquid under microgravity conditions was to be examined. Gas bubbles would be separated out of a liquid by artificial gravity. After separation, the gas would be circulated by a pump and injected into liquid again in a mixing box.

G-457 was designed to investigate bubble motion in microgravity.

G-337

77

Customer:	Dept. of Defense Space Test Program; Colonel J. E. Armstrong
Payload Mgr:	David Rigmaiden
NASA Tech Mgr:	Tom Dixon
Mission:	STS-42, January 22, 1992

This experiment was the first autonomous application of an entirely new refrigeration cycle which used sound to pump heat with only one moving part. Unlike conventional refrigerators which use compressors and ozone-depleting chlorofluorocarbons (CFCs), the thermoacoustic refrigerator was designed to use standing sound waves and inert gas to produce refrigeration.

The experiment was a joint effort of the Physics Department and Space Systems Academic Group at the U.S. Naval Postgraduate School. Financial and material support was supplied by the Naval Research Laboratory.

Many GAS experiments were designed to test new technology concepts for the first time.